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INVESTISSEMENTS D'AVENIR

Characterization of two large chromosomal translocations in *Musa acuminata ssp. burmannicoides* "Calcutta4"

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A few *Musa acuminata* subspecies are involved in banana cultivars. Theses subspecies diverged following geographical isolation in distinct Southeast Asian continental regions and islands. Observation of chromosome pairing irregularities in meiosis of hybrids between theses subspecies suggested the presence of large chromosomal structural variations.

We analyzed accession "Calcutta4" from the subspecies *burmannicoides* to search for chromosomal structural variations relative to the reference sequence assembly obtained with a *M. a.* ssp *malaccensis* accession.

A self progeny of Calcutta4 was genotyped by GBS (genotyping by sequencing). We observed linkage between markers from reference chromosome 2 and 8 and reference chromosome 1 and 9 suggesting the presence of two reciprocal translocations involving these two pairs of chromosomes.

Large insert size paired reads (5 and 8kb) from "Calcutta4" were mapped on the reference sequence to confirm the presence of these translocations and precisely locate the translocation breakpoints. Analysis of discordant read mapping suggested a first reciprocal translocation involving a 240Kb distal region of acrocentric chromosome 2 and a 7.2 Mb distal region of chromosome 8. A second reciprocal translocation involves a 20.8Mb distal region of acrocentric chromosome 1 and a 11.6Mb distal region of chromosome 9, with intricate events of duplication and deletion at the breakpoint.

We are currently using BAC-FISH to validate these structural variations.

Perspectives are to develop PCR markers at the breakpoint to analyze the presence of these rearrangements in Musa germplasm and to analyze of the impact of these rearrangements in heterozygous accessions.